

1. A computer-based printing system comprising:

a computing device containing print data and capable of initiating a print job;

one or more output devices accessible from said computing device, said

5 output devices having one or more corresponding printer drivers in support thereof;

means for initiating a print job, said means indicating that said print data is to be despooled to one or more of said output devices, said print job comprising said print data;

10 a virtual printer driver supported by said printing system and called by said means for initiating said print job, wherein said virtual printer driver determines and selects which of said output devices to send said print job, said determination based upon a best fit analysis between said output devices and one or more options and  
15 requirements of said print job, without manual enumeration of each of said output devices; and

a print control assembly in communication with said computing device, said print control assembly capable of storing, processing and directing a set of printing instructions as received from said virtual  
20 printer driver.

2. The printing system of claim 1, wherein said printing system comprises a networked environment.

5 3. The printing system of claim 1, wherein said printing system comprises a peer-peer environment.

4. The printing system of claim 1, wherein said printing system comprises a local environment, wherein said computing device is directly coupled to said output devices,  
10 thus defining said printing system.

5. The printing system of claim 1, wherein said virtual printer driver is supported on said computing device.

15 6. The printing system of claim 1, wherein said computing device is a client computing device.

7. The printing system of claim 1, wherein said computing device is a server computing device.

8. The printing system of claim 1, wherein said computing device is capable of  
5 determining the capabilities, status, and locality of said output devices without manual enumeration through each respective printer driver and status monitor.

9. The printing system of claim 1, wherein said print job is initiated from within an application program.

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10. The printing system of claim 1, wherein said print job is initiated from a background process.

11. The printing system of claim 1, wherein said print job is initiated automatically by  
15 an automated process.

12. The printing system of claim 1, wherein said virtual printer driver comprises and displays a dialog comprising selectable options and requirements that a user may specify for said print job.

5 13. The printing system of claim 12, wherein said dialog comprises selectable options and requirements that are selected from the group consisting of collation, sheet assembly, finishing characteristics, image processing, job splitting, printer pooling, and intelligent routing.

10 14. The printing system of claim 1, wherein said virtual printer driver ascertains the capabilities, locality, if any, and status of each of said output devices accessible from said computing device and displays such to said user.

15 15. The printing system of claim 14, wherein said virtual printer driver ascertains said capabilities, locality, if any, and status of each of said output devices prior to said displaying said capabilities and status designations to said user, such that said user may select only those features that are available on at least one of said output devices.

16. The printing system of claim 14, wherein said output devices comprise capabilities, locality, if any, and status designations selected from the group consisting of printer driver capabilities, printer firmware capabilities, printer finishing capabilities, printer queue status, printer status, and printer locality.

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17. The printing system of claim 1, wherein said accessibility of said output devices and said corresponding printer drivers is determined from said output devices and said corresponding printer drivers being pre-installed on said computing device.

10 18. The printing system of claim 1, wherein said accessibility of said output devices and corresponding printer drivers is determined from said output devices and said corresponding printer drivers being downloadable from a print server.

15 19. The printing system of claim 1, wherein said accessibility of said output devices and corresponding printer drivers is determined from said output devices and said corresponding printer drivers being discoverable using an auto-discovery program.

20. The printing system of claim 1, wherein said virtual printer driver queries print assist components to be incorporated into said print job.



25. The printing system of claim 1, wherein said printing instructions comprise said print data, information on said capabilities, locality, and status of said output devices, and said requirements and options of said print job.

5 26. The printing system of claim 1, wherein said print control assembly comprises components selected from the group consisting of at least one printer driver, a spooling device, a print processor, a port manager, and a print server.

10 27. The printing system of claim 1, wherein said print control assembly is contained within and supported by said output device.

28. A method of initiating a print job within a computer-based printing system, said method comprising the steps of:

5 generating print data within a client computing device, said client computing device connected to and in communication with said computer-based printing system;

making accessible to said computer-based printing system one or more output devices, such that said output devices are in communication with said computer-based printing system and said client computing device;

10 calling a virtual printer driver from said client computing device, said virtual printer driver supported on said computer-based printing system and performing the task of processing and sending said print data in a print data stream to one of said output devices for printing according to the method steps comprising:

15 gathering information on the capabilities, locality, if any, and status of said one or more output devices, including corresponding printer drivers associated with said respective output devices, accessible from said client computing device;

20 displaying to said user a dialog of a plurality of options and requirements pertaining to said print job;



allowing said user to identify and select from said dialog which of  
said options and requirements are desired for said print job,  
said information on the capabilities, locality, and status of  
said one or more output devices and said options and  
5 requirements of said print job combining to define a set of  
printing instructions;

selecting one or more of said output devices by which said virtual  
printer driver may direct said print job, said step of  
selecting being based upon and according to a best fit  
10 between said capabilities and status of said output devices  
and said options and requirements of said print job, said  
best fit based on one or more identified criteria of said  
plurality of output devices, without manual enumeration of  
each respective said plurality of output devices by said  
15 client computing device;

causing said printing instructions to be communicated and  
rendered to the corresponding printer drivers of said  
selected output devices;

causing said corresponding printer drivers of said selected output devices to write  
20 said printing instructions to the corresponding port managers of said  
selected output devices; and

printing said print data on said selected output devices according to said printing instructions.

29. The method of claim 28, wherein said step of gathering information further  
5 comprises the step of:

querying a printer driver and corresponding print queue in each of said plurality of output devices.

30. The method of claim 28, wherein said step of calling a virtual printer driver that  
10 performs the task of processing and sending said print data in a print data stream to one of said output devices for printing further comprises the step of:

querying a print assist component selected from the group consisting of a document processing assembly, an image processing assembly, and a sheet assembly;

- 15 inserting said print assist component into said print data stream.

31. The method of claim 28, wherein said step of selecting one or more of said output devices comprises selecting one or more groups of said output devices in the case of cluster printing.

32. The method of claim 28, wherein said step of selecting one or more of said output devices is automatically carried out by said virtual printer driver.

5 33. The method of claim 28, wherein said step of selecting one or more of said output devices is carried out through an interactive approach with said user.

34. The method of claim 28, wherein said step of selecting comprises automatically selecting a single printing device or group from the larger set, using an identified  
10 algorithm, if more than one printing device or group of printing devices are selected by said virtual printer driver.

35. The method of claim 34, wherein said identified algorithm is selected from the group consisting of highest output resolution, first available printer, closest in proximity,  
15 and fastest to complete.

36. The method of claim 28, wherein said step of selecting comprises said user interactively selecting a single printing device or group if more than one printing device or group of printing devices are selected by said virtual printer driver.

37. The method of claim 28, wherein said step of causing said printing instructions to be communicated and rendered to the corresponding printer drivers of said selected output devices is effectuated by said virtual printer driver switching a device context to  
5 said corresponding printer drivers of said selected output devices, wherein an application or background process containing said print data writes said printing instructions to said corresponding printer drivers, said corresponding printer drivers then spool said print data to a spooler, which then despools said print data to a port manager or a print processor.

10 38. The method of claim 37, wherein said print processor writes said print data directly to a port manager of said selected output devices if said print data is printer ready.

39. The method of claim 37, wherein said print processor plays back said print data to  
15 said printer drivers on said client computing device if said print data is journaled print data.

40. The method of claim 37, wherein said print processor despools said print data to a print server for deferred rendering if said print data is journaled print data.

41. The method of claim 28, wherein said step of causing said printing instructions to be communicated and rendered to the corresponding printer drivers of said selected output devices is effectuated by an application or background process containing said  
5 print data writing said printing instructions to said virtual printer driver, which in turn plays back said printing instructions to said corresponding printer drivers of said selected output devices.

42. The method of claim 28, wherein said step of gathering information on the  
10 capabilities, locality, and status of said one or more output devices, including corresponding printer drivers associated with said respective output devices, accessible from said client computing device causes to be limited what is displayed to said user in said dialog by only allowing said dialog to display, and said user to select, those said options and requirements that are supportable by at least one of said output devices as  
15 determined by said virtual printer driver in said step of gathering information.

43. A computer program product comprising a virtual printer driver within a computer-based printing system, said virtual printer driver comprising code that directs a computer to:

5 initiate a print job from a computing device as directed by a user, said print job comprising print data;

gather information on the capabilities, locality, and status of one or more output devices accessible from said computing device, said output devices including corresponding print queues;

10 display to said user a dialog of a plurality of options and requirements pertaining to said print job;

allow said user to identify and select from said dialog which of said options and requirements are desired for said print job, said information on the capabilities and status of said one or more output devices and said options and requirements of said print job combining to define a set of printing instructions;

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select one or more of said output devices by which said virtual printer driver may direct said print job, said step of selecting being based upon and according to a best fit between said capabilities and status of said output devices and said options and requirements of said print job, said best fit based on one or more identified criteria of said plurality of output devices, without

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manual enumeration of each respective said plurality of output devices by  
said client computing device;

render said printing instructions to said corresponding printer drivers of said  
selected output devices; and

5 print said print data on said selected output devices according to said printing  
instructions.

44. A computer system for matching the best available printer with an outstanding print job, said system comprising:

a gathering component that gathers information pertaining to the capabilities,  
locality, and status of each of one or more output devices accessible to a  
computing device;

a dialog component that displays, and wherein a user may select, any  
requirements and options pertaining to said print job, said information  
pertaining to said capabilities, locality, and status of said output devices  
and said options and requirements pertaining to said print job combining  
to define a set of printing instructions;

a selection component that selects one or more of said output devices to print said  
print job, said selection component basing said selection upon a best fit  
between said requirements and options of said print job and said  
capabilities, locality, and status of said output devices; and

a rendering component for rendering said printing instructions to said selected  
output devices, wherein said print job is printed.



45. A computer readable medium containing a data structure for storing the capabilities and status of one or more output devices accessible to a computing device to be used in conjunction with requirements and options of a print job, based upon a best fit of such, to determine which of said computing devices is to be used to print said print job

5 without manual enumeration of each of said output devices.